OPERATING SUMMARY

1973

TRENTON

WATER POLLUTION CONTROL PLANT

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TRENTON

WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF TRENTON

by the

MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
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CONTENTS

Title Page 1

Flow Diagram 4

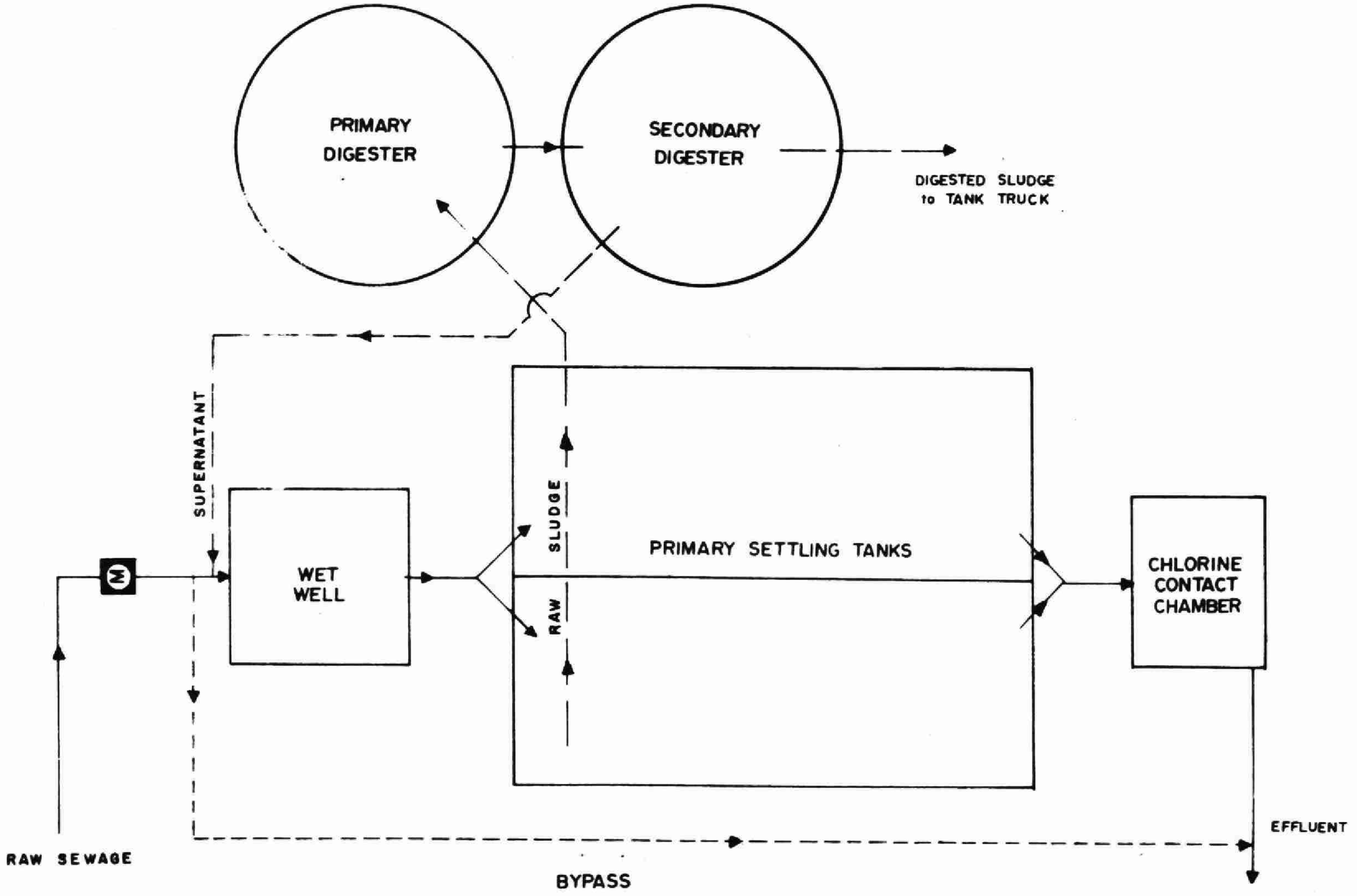
Design Data 5

'73 Review 6

Project Costs 8

Process Data 10

TOWN OF TRENTON WPCP



DESIGN DATA

PROJECT		Town of Trenton WPCP
TREATMENT		Primary
DESIGN FLOW		1.0 mgd
DESIGN POPULATION		12,000
BOD	- Raw Sewage	250 mg/l
	- Removal	35%
SS	- Raw Sewage	200 mg/l
	- Removal	55%

PRIMARY TREATMENT

Grit Removal

Type: Aerated, with air lift
Size: One 10' x 9' x $8\frac{1}{2}$' (4,775 gal)
Retention: 1.5 min

Primary Sedimentation

Type: Jeffrey
Size: Two 52' x 16' x 12' (125,000 gal)
Retention: 3.0 hr
Loading: Surface, 600 gal/ft^2/day
Weir, 8340 gal/ft/day

Air Supply

Two Roots-Connersville

CHLORINATION

Type: F & P

Chlorine Contact Chamber

- not provided; chlorination in outfall

OUTFALL

- 850 ft of 30" concrete pipe to Bay of Quinte

SLUDGE HANDLING

Digestion System - Two-stage

Primary --
Type: Gas mixed, fixed cover; PFT
Size: One 28' dia x 23' (13,500 cu ft or 84,000 gal)
Loading: 2.62 lb/cu ft/mo

Secondary --
Type: Fixed cover
Size: One 28' dia x 23' (13,500 cu ft or 84,000 gal)
Total Loading: 1.31 lb/cu ft/mo

PUMPING STATIONS

Dundas Street Pumping Station

Type: Fairbanks-Morse
Size: One 700 gpm @ 39' tdh
One 1740 gpm @ 48' tdh
One 3130 gpm @ 68' tdh (diesel)

'73 Review

GENERAL

1973 was the first full year of the integrated operation of the Trenton/Batawa/Frankford projects. The integration has resulted in more flexibility, increased ability to respond quickly in emergencies, improved preventative maintenance and improvement generally in the operation of the projects.

During the year major maintenance work included overhauls of the chlorinator and #2 sewage lift pump. The entire interior of the plant was painted and a small shed constructed for housing grounds maintenance equipment. A tractor with mower and snowblower attachments was purchased. A new bubbler system was installed at the Dundas Street pumping station to control the operation of the pump.

EXPENDITURES

The cost of operating the sewage works in 1974 was $50,312, slightly above the budget of $45,000. The budget did not allow sufficiently for the effects of inflation. The cost of treating one million gallons of sewage was $49.47, relatively unchanged from the 1972 cost of $48.79.

PLANT PERFORMANCE AND TREATMENT DATA

Flows for the year totalled 1,017 million gallons, similar to the 1972 total of 1,007 million gallons.

The average daily flow was 2.79 million gallons, as compared to 2.75 million gallons during the previous year.

The sewage BOD was reduced by 31 percent from an influent concentration of 220 mg/l to an effluent concentration of 150 mg/l. The sewage suspended solids was reduced by 46 percent from an influent concentration of 180 mg/l to an effluent concentration of 98 mg/l. Phosphorous concentrations averaged 5.4 mg/l in the influent and 4.3 mg/l in the effluent for a reduction of 20 percent.

A total of 1,793,000 gallons of raw sludge was pumped to the digesters. A total of 148,000 gallons of digested sludge, 123,000 gallons of raw sludge and 348 cubic feet of grit was removed from the plant. The plant effluent was disinfected with a total of 24,200 pounds of chlorine.

PLANT LOADING

Flows during 1973 averaged 279 percent of plant design capacity, relatively unchanged from 1972. The BOD loading decreased from 277 percent of design capacity in 1972, to 245 percent in 1973. The suspended solids loading also decreased, from 294 percent of design in 1972 to 251 percent of design in 1973.

CONCLUSIONS

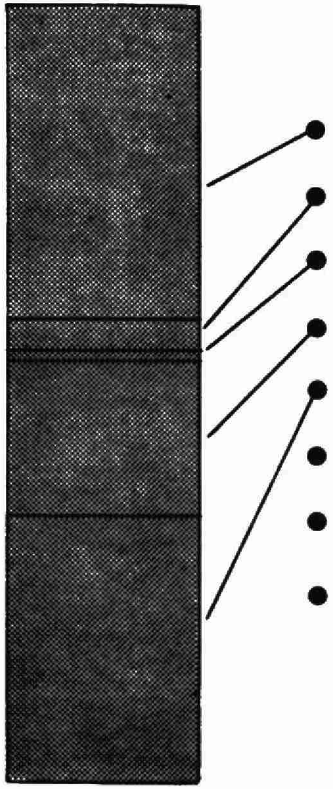
Treatment efficiency has been poor as a result of the grossly overloaded condition of the plant.

The raw sewage BOD and suspended solids loadings decreased in 1973 from 1972. The decrease is believed to be a direct result of efforts by the municipality to enforce the Industrial Waste Bylaw. The average BOD loading in 1972 was 6,925 pounds per day. In 1973, the BOD loading dropped to 6,125 pounds per day. The BOD design capacity of the new secondary treatment plant, scheduled to start up early in 1976, is 6,250 pounds per day. It is, therefore, critical that vigorous and continuing enforcement of the Industrial Waste Bylaw be practised.

Flows reaching the plant have increased to the point that they are limited by the capacity of the pumping stations. Expansion of the pumping stations will be completed early in 1976. However, the new plant has a capacity of 3.5 mgd and this capacity will soon be exceeded if present trends continue. A major three year programme to reduce infiltration into the sewer system by the municipality is presently underway. This programme should reduce the hydraulic loading to the new plant significantly.

ANNUAL COSTS

1973 OPERATING COSTS



SALARIES & WAGES	40 %
EMPLOYEE BENEFITS	4 %
TRANSPORTATION & COMMUNICATIONS	1 %
SERVICES	19 %
SUPPLIES & EQUIPMENT	36 %
AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	NIL
TRANSFER PAYMENTS	NIL
OTHER TRANSACTIONS	NIL

YEARLY OPERATING COSTS

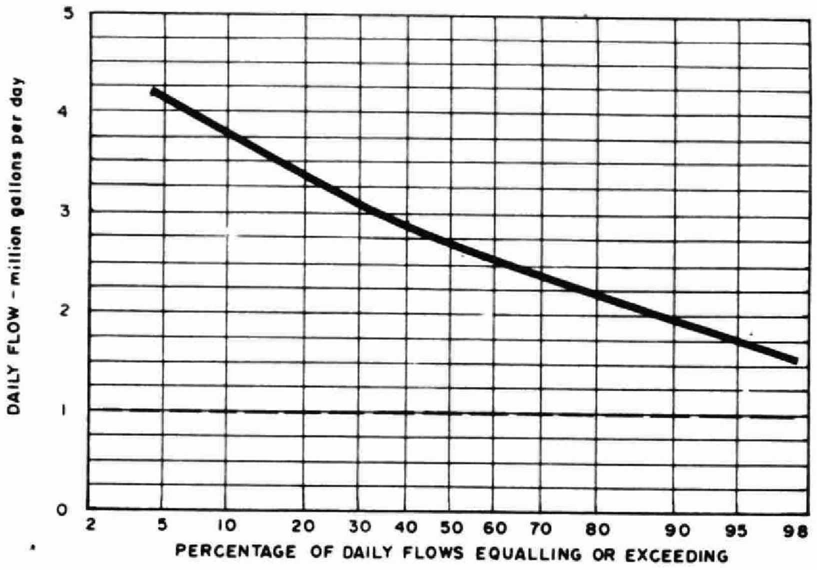
YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			$/M.G.	¢/lb BOD
1968	467	$ 26,432	57	4
1969	402	28,799	37	5
1970	607 *	40,728	66	8
1971	780 *	41,695	53	5
1972	1005	49,135	49	9
1973	1017	50,313	49	6

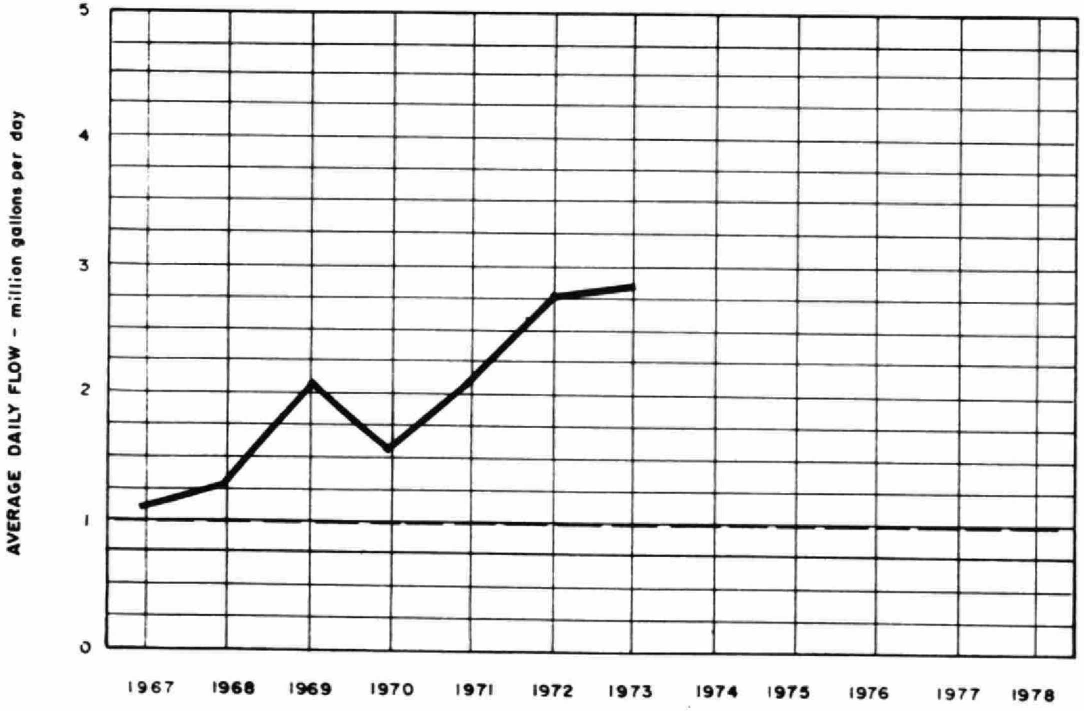
* Estimate

OPERATING EXPENDITURES

SALARIES AND WAGES	$ 20,237
EMPLOYEE BENEFITS	2,248
TRANSPORTATION & COMMUNICATIONS	707
SERVICES	9,177
SUPPLIES AND EQUIPMENT	17,944
ACQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	0
TRANSFER PAYMENTS	0
OTHER TRANSACTIONS	0
TOTAL	$ 50,313

PROCESS DATA
FLOWS



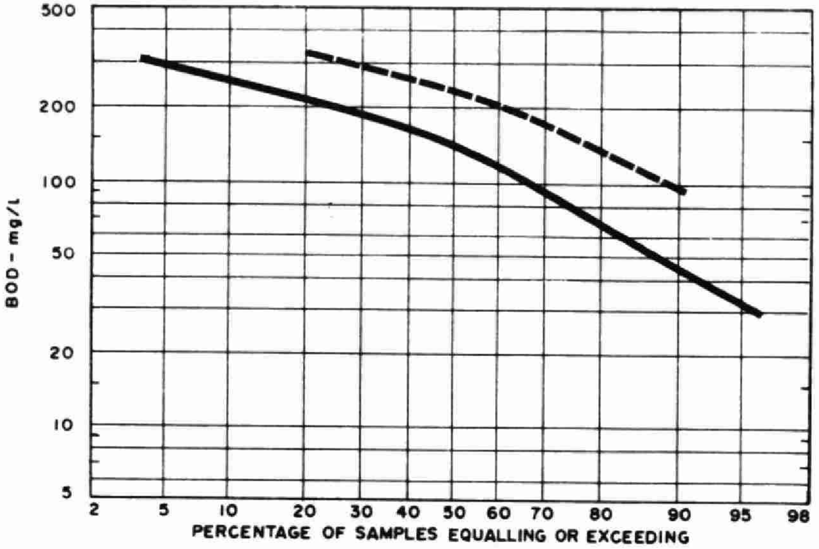


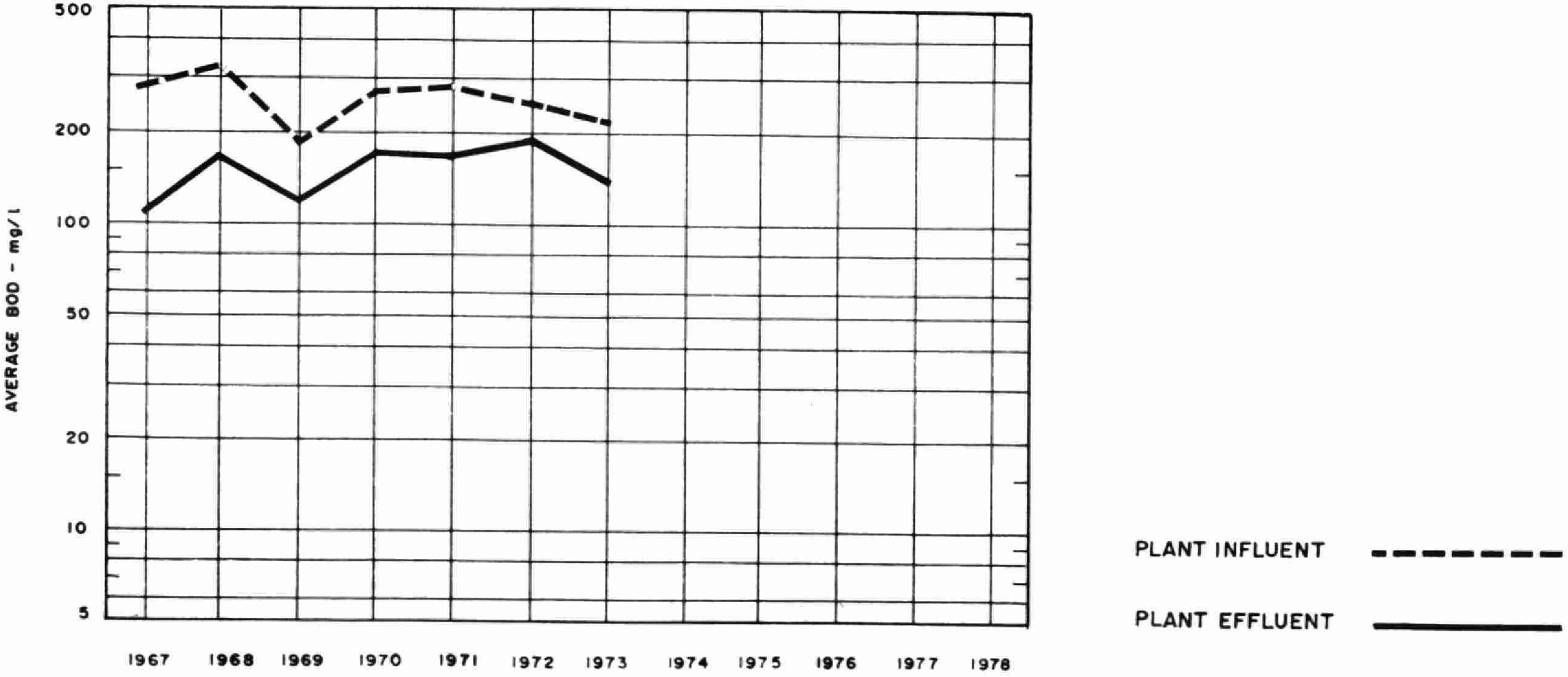
DESIGN CAPACITY – – – – – – – –

PLANT PERFORMANCE

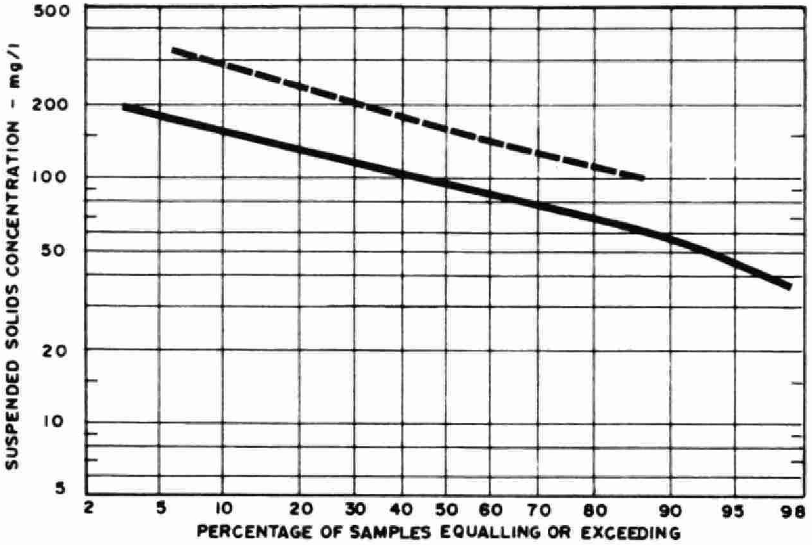
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	mg/l P	mg/l P
JAN	115.4	3.7	5.0	230	180	19	50	190	140	26	58	6.3	5.7
FEB	88.7	3.2	4.6	280	140	50	124	170	140	18	22	6.6	5.9
MAR	110.1	3.7	4.7	110	65	42	53	100	53	49	55	4.1	2.8
APR	97.9	3.3	4.1	160	100	65	64	140	57	41	57	4.5	3.0
MAY	89.9	2.9	4.4	330	160	53	160	280	88	69	177	7.7	4.2
JUNE	84.0	2.8	3.7	160	140	12	17	480	150	69	277	6.4	5.0
JULY	74.5	2.4	3.6	180	120	36	48	210	140	32	50	5.4	4.6
AUG	59.6	1.9	2.4					110	90	18	12		8.1
SEPT	65.1	2.2	3.2	240	170	29	46	150	100	33	32	7.6	5.3
OCT	69.5	2.2	3.0	210	190	15	14	130	110	15	14	5.5	4.4
NOV	82.2	2.7	3.4	310	200	34	86	200	110	43	69	4.0	3.1
DEC	80.2	2.6	3.6	220	190	16	28	140	93	33	36	5.2	4.9
TOTAL	1017.1	-	-	-	-	-		-	-	-	859	-	-
AVG.		2.8	MAXIMUM 5.0	220	150	31	65	180	98	42	72	5.4	4.3
No. of Samples	-	-	-	24	24	-	-	25	25	-	-	24	25

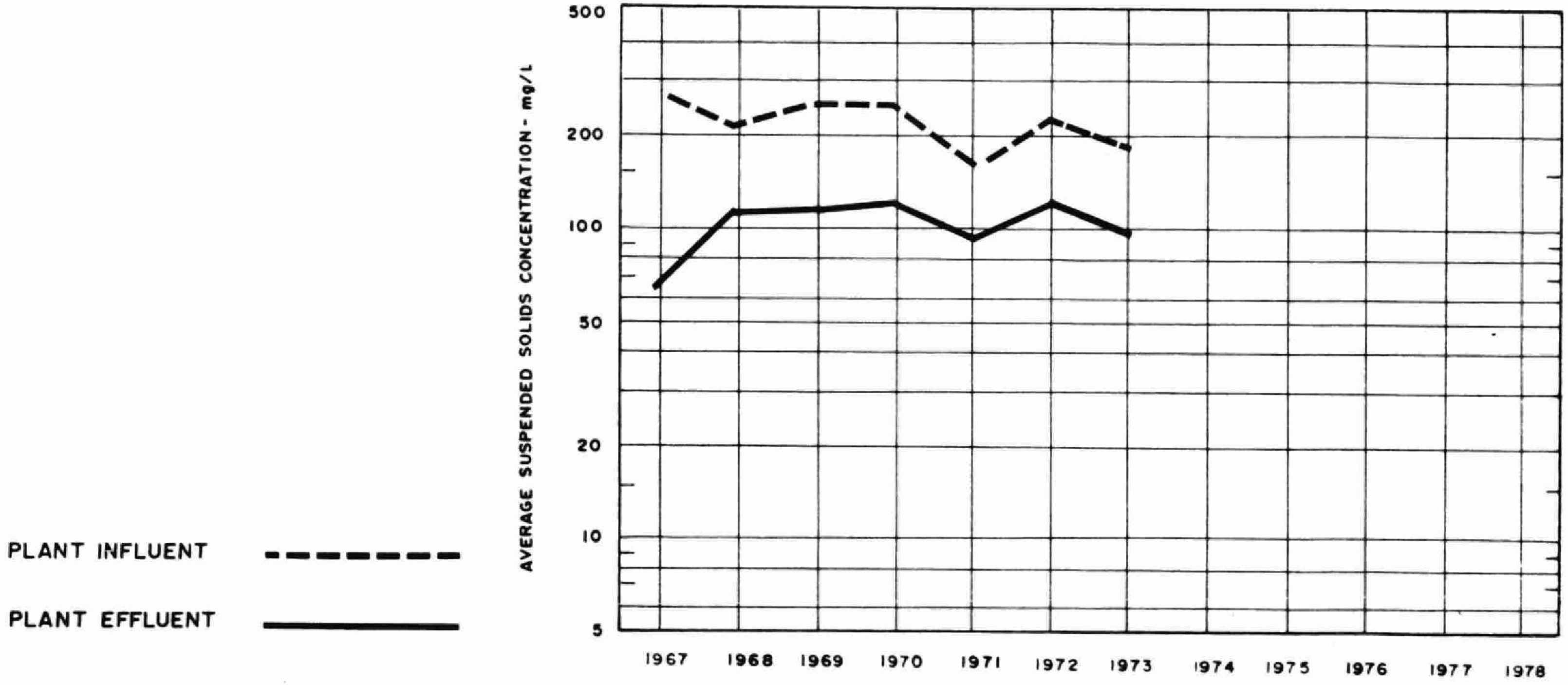
BIOCHEMICAL OXYGEN DEMAND



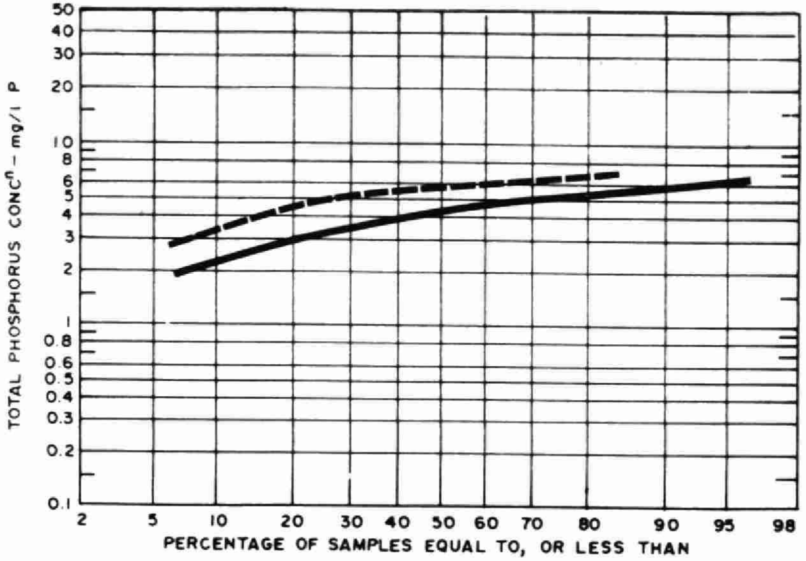


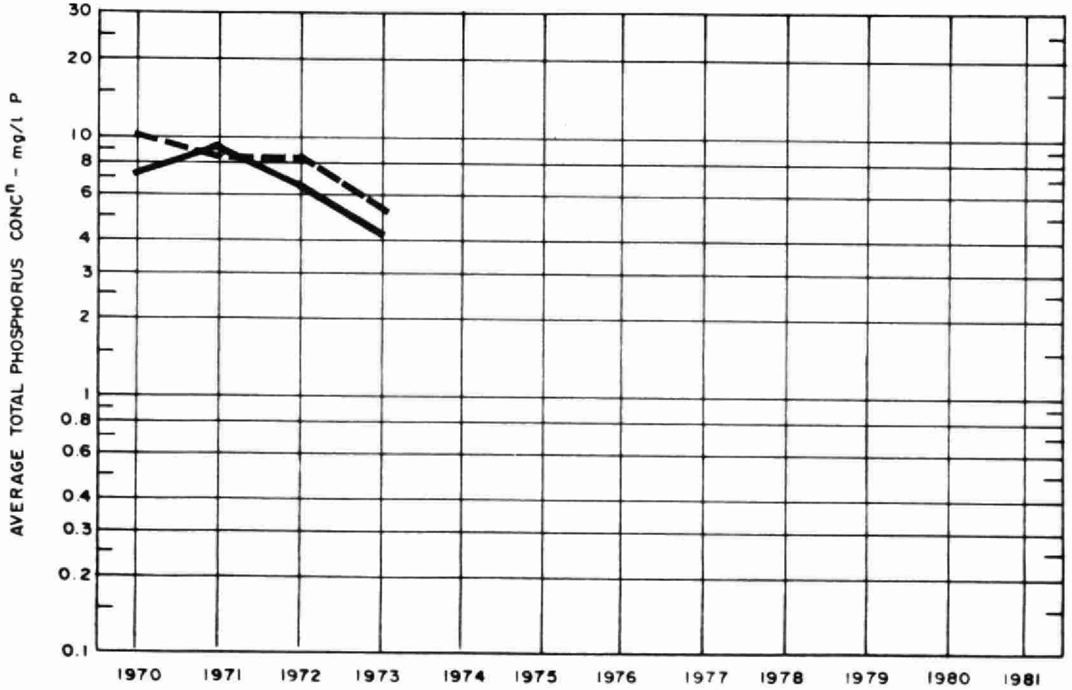
SUSPENDED SOLIDS





PHOSPHORUS

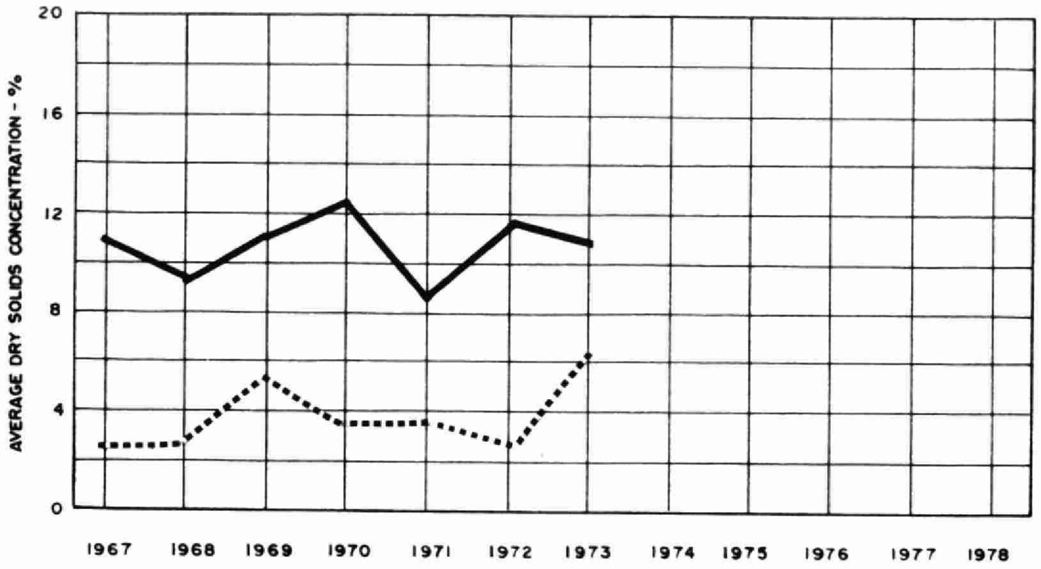


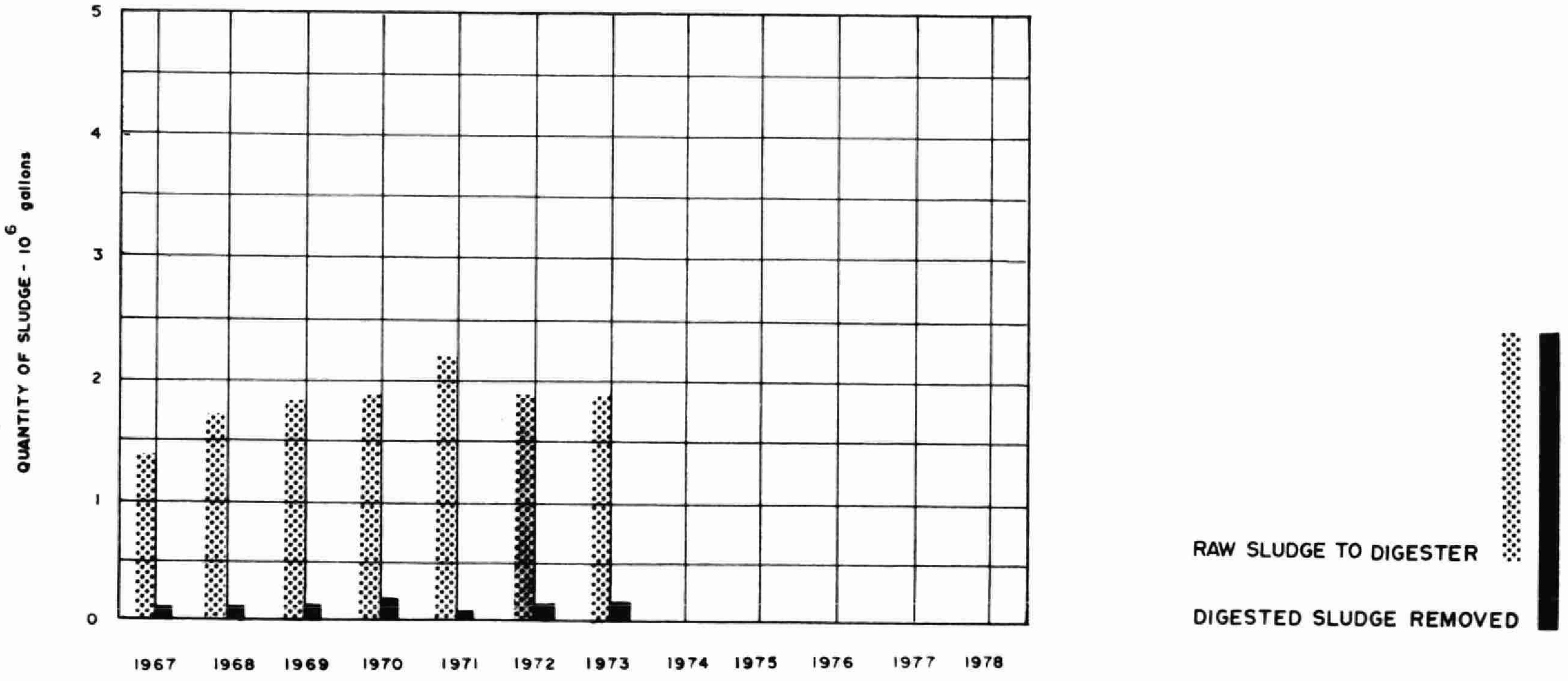


PLANT INFLUENT - - - - - -

PLANT EFFLUENT ———

DIGESTION


RAW SLUDGE ··············
DIGESTED SLUDGE ————
AVERAGE DRY SOLIDS CONCENTRATION - %
20
16
12
8
4
0
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978


QUANTITY OF SLUDGE - 10^6 gallons
5
4
3
2
1
0
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED

TREATMENT DATA

	GRIT	CHLORINATION		SLUDGE DIGESTION and DISPOSAL							
				RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT	
MONTH	QUANTITY REMOVED cubic feet	CHLORINE USED 10^3 pounds	AVERAGE DOSAGE mg/l	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	QUANTITY REMOVED 10^3 gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	TOTAL SOLIDS %	SLUDGE HAULED cubic yards
JAN		1.6	1.4	128							
FEB		1.6	1.8	118	11.7	43	24.5	13.7		0.9	146
MAR		2.4	2.2	131	6.8			13.2		0.8	
APR		2.4	2.5	126	6.9		13.5	15.8		1.1	80
MAY	101	2.5	4.6	130	5.0		28.3	8.4		0.2	168
JUNE	28	2.3	3.5	160			14.2				84
JULY		1.8	2.5	194			30.2	12.5			180
AUG	50	1.6	2.6	186	7.9		28.3	6.8		0.2	168
SEPT	54	1.8	2.8	180	5.1		8.5	4.8		0.5	50
OCT	25	1.6	2.5	76	6.2			10.6			95*
NOV	74	2.2	2.6	152	2.1			13.7		0.9	481 *
DEC	16	2.4	3.0	212	3.9			10.1		0.9	154*
TOTAL	348	24.2	–	1793	–	–	147.5	–	–	–	1606
AVG.	0.3 cubic feet/mil gal	2.0	2.4	149	6.2	43	21.1	11.0		0.7	161

* Raw sludge

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